

WHAT IS CLAIMED IS:

1. A modified oilseed material comprising at least about 85 wt.% (dsb) protein; wherein at least about 40 wt.% of the protein has an apparent molecular weight of greater than 300 kDa; and the modified oilseed material has a gel breaking strength of at least 0.50 N.
2. A modified oilseed material comprising at least about 85 wt.% (dsb) protein; wherein the modified oilseed material has an MW₅₀ of at least about 200 kDa; and the modified oilseed material has a dispersion viscosity of at least about 0.5 Nsm⁻².
3. A modified oilseed material comprising at least about 85 wt.% (dsb) protein; wherein the modified oilseed material has an MW₅₀ of at least about 200 kDa; and the modified oilseed material has an ESI of no more than about 70 mm.
4. A modified oilseed material comprising at least about 85 wt.% (dsb) protein; wherein the modified oilseed material has an MW₅₀ of at least about 200 kDa; and a gel breaking strength of at least 0.50 N.
5. The modified oilseed material of claim 4 wherein the modified oilseed material has a gel breaking strength of at least 0.60 N.
6. The modified oilseed material of claim 4 wherein the modified oilseed material has a dispersion viscosity of at least about 0.4 Nsm⁻².
7. The modified oilseed material of claim 4 wherein the modified oilseed material has an ESI of no more than about 60 mm.
8. The modified oilseed material of claim 4 wherein the modified oilseed material has an NSI of at least 80.

9. The modified oilseed material of claim 4 wherein at least about 40 wt.% of the protein has an apparent molecular weight of greater than 300 kDa.

10. The modified oilseed material of claim 4 wherein the modified oilseed material has a bacterial load of no more than 50,000 cfu/g.

11. The modified oilseed material of claim 4 comprising a flavor component content including no more than about 500 ppb benzaldehyde; no more than about 2500 ppb 2-pentyl furan; no more than about 600 ppb 2-heptanone; and no more than about 200 ppb E,E-2,4-decadienal.

12. The modified oilseed material of claim 4 comprising a flavor component content which includes no more than about 350 ppb benzaldehyde; no more than about 450 ppb 2-heptanone; no more than about 150 ppb E,E-2,4-decadienal; and no more than about 50 ppb E,E-2,4-nonadienal.

13. The modified oilseed material of claim 4 wherein the modified oilseed material comprises modified soybean material.

14. The modified oilseed material of claim 4 wherein the modified oilseed material comprises at least about 90 wt.% (dsb) protein.

15. A method for producing a modified oilseed material comprising the steps of:

(1) extracting oilseed material with an aqueous solution to form an oilseed extract;

(2) passing the extract through a filtration system including a microporous membrane to produce a first permeate and a protein-enriched retentate;

(3) heating the retentate at a pH of about 7.1 to 7.8 to a temperature of about 200-250°F for sufficient time to form a pasteurized modified oilseed material.

16. The method of claim 15 further comprising drying the pasteurized modified oilseed material.

17. The method of claim 16 wherein drying the pasteurized modified oilseed material comprises drying a pasteurized modified oilseed material having a pH of about 7.0 to 8.0.

18. The method of claim 15 wherein heating the retentate comprises heating the retentate at a pH of about 7.2 to 7.5.

19. The method of claim 15 wherein heating the retentate comprises heating the retentate for about 2 to 30 seconds.

20. A modified oilseed material produced by a process which includes extracting oilseed material with an aqueous solution to form an oilseed extract; passing the extract through a filtration system including a microporous membrane to produce a permeate and a protein-enriched retentate; heating the protein-enriched retentate to a temperature of about 200-250°F at a pH of about 7.1 to 7.8 for a sufficient time to form a pasteurized retentate; and spray drying the pasteurized retentate.

21. A method for producing a modified oilseed material comprising:

extracting oilseed material with an aqueous solution to form a suspension of particulate matter in an oilseed extract;

passing the extract through a filtration system including a microporous membrane to produce a first permeate and a protein-enriched retentate, wherein the microporous membrane has an MWCO of at least 25,000 and a filtering surface with a contact angle of no more than 30 degrees;

heating the protein-enriched retentate at a pH of about 7.1 to 7.8 for sufficient time to form a pasteurized retentate; and

drying the pasteurized retentate to form the modified oilseed material.

22. The method of claim 21 further comprising:

diafiltering the protein-enriched retentate through the filtration system to produce a diafiltration retentate and a diafiltration permeate, wherein the diafiltration retentate includes protein-enriched dissolved solids;

combining the first permeate and the diafiltration permeate to form a combined permeate; and

separating the combined permeate with a reverse osmosis membrane into an RO retentate and an RO permeate.

23. The method of claim 21 wherein heating the protein-enriched retentate is heated to about 200-250°F.

24. The method of claim 21 wherein drying the pasteurized retentate comprises drying a pasteurized retentate having a pH of about 7.1 to 7.8.

25. The method of claim 21 wherein heating the protein-enriched retentate comprises heating the protein-enriched retentate at a pH of about 7.2 to 7.5 for sufficient time to form a pasteurized retentate.

26. The method of claim 21 wherein drying the pasteurized retentate comprises drying a pasteurized retentate having a pH of about 7.2 to 7.5.

27. The method of claim 21 wherein the protein-enriched retentate comprises at least about 85 wt.% (dsb) protein.

28. The method of claim 21 wherein the protein-enriched retentate comprises at least about 90 wt.% (dsb) protein.

29. The method of claim 21 comprising passing the extract through the filtration system under a transmembrane pressure of no more than 50 psig.

30. The method of claim 21 comprising passing the extract through the filtration system at 50°C to 65°C.

31. The method of claim 21 wherein extracting the oilseed material comprises contacting the oilseed material with an the aqueous alkaline solution having a pH of about 6.5 to 10.0.

32. The method of claim 21 wherein the aqueous alkaline solution has a pH of about 7.0 to 8.5.

33. The method of claim 21 wherein the microporous membrane is an ultrafiltration membrane having an MWCO of about 25,000 to 500,000.

34. The method of claim 21 wherein the extraction operation is a continuous process with an apparent contact time of no more than 20 minutes.

35. The method of claim 21 wherein the oilseed material comprises oilseed material derived from defatted soybean.

36. The method of claim 35 wherein the oilseed material comprises soybean white flake.

37. A method for producing a modified oilseed material comprising:

extracting oilseed material with an aqueous alkaline solution at 20°C to 60°C to form a mixture of particulate matter in an extract solution;

removing at least a portion of the particulate matter from the mixture to form a clarified extract having a dissolved solids content of at least 5 wt.%;

passing the clarified extract at 200°F to 250°F through a filtration system including a microporous modified polyacrylonitrile membrane to produce a permeate and a protein-enriched retentate;

heating the protein-enriched retentate to at least 200°F at a pH of about 7.1 to 7.8 for a sufficient time to form a pasteurized retentate; and

spray drying the pasteurized retentate at a pH of about 7.1 to 7.8 to form a dried modified oilseed material having a water content of no more than about 10 wt.%.

38. The method of claim 37 wherein the microporous modified polyacrylonitrile membrane has an MWCO of 25,000 to 500,000 and a filtering surface with a contact angle of no more than 30 degrees.

39. The method of claim 37 wherein the protein-enriched retentate includes at least about 70 wt% (dsb) protein.

40. The method of claim 37 wherein the protein-enriched retentate includes at least about 90 wt% (dsb) protein.

41. A food composition comprising a modified oilseed material, wherein the modified oilseed material comprises at least 85 wt.% protein on a dry solids basis; at least about 40 wt.% of the protein has an apparent molecular weight of at least 300 kDa; and the modified oilseed material has a gel breaking strength of at least 0.50 N.

42. The food composition of claim 41 wherein the food composition is a processed meat composition.

43. The food composition of claim 41 wherein the food composition is a processed meat analog.

44. The food composition of claim 41 wherein the food composition is a sauce, soup or dressing.

45. A modified oilseed material comprising at least about 90 wt.% (dsb) protein; wherein the modified oilseed material has an MW₅₀ of at least about 200 kDa; the modified oilseed material has a gel breaking strength of at least 0.50 N; the modified oilseed material has an NSI of at least 80; and the modified oilseed material has an ESI of no more than about 60 mm.

46. The modified oilseed material of Claim 45 wherein the water content of the modified oilseed material is no more than about 10 wt.%; and the modified oilseed material has an average particle size of no more than about 200 microns.

47. The modified oilseed material of Claim 46 wherein the modified oilseed material has an average particle size of about 50 to 150 microns.